



Maternal mortality - changing trends

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OBJECTIVE(S) : To review trends in maternal mortality in apex hospitals of western Maharashtra.

METHOD(S) : Data on maternal deaths were collected from our institute (KIMS) and Satara district health unit for the last 5 years. Maternal mortality data from three apex hospitals for the last four decades were reviewed for comparison of trends in maternal mortality rates (MMR) and causes of maternal death.

RESULTS: Maternal deaths from KIMS and Satara district health unit were reported to be 191 during the years 2000 to 2005 giving maternal mortality rate (MMR) of 32 per 10,000 births. Except for 51 deaths all were attributed to hemorrhage and pregnancy induced hypertension (PIH). In a review of data over last four decades MMR has declined from 210 (1967) to 37 (2005). There is a marked decline in MMR related to intrapartum complications, abortions and sepsis.

CONCLUSION(S) : MMR for all causes of maternal deaths declined significantly from 1966 to 1998. It has remained steady at 32 to 40 per 10000 births thereafter. Hemorrhage and PIH have emerged as greatest killers.

Key words : MMR, trends in MMR

Introduction

Maternal deaths in developing countries constitute a tragedy of vast proportions. Those who suffer generally live in remote places, and are poor and helpless. Today the rates of maternal mortality in rich and poor countries show a greater disparity than any other public health indicator.

Maternal mortality rates (MMRs) which measure the risk of dying from pregnancy are highest in Africa and Southern Asia¹ ranging from 80 to 100 per 10,000 live births. The rates are nearly double in rural areas as compared to those in urban areas.

Most of the evidence for maternal mortality is obtained through hospital data and community based reports both of which have their limitations. Hospital data point to high rates but are misleading when it comes to exact levels. They are

valuable when it refers to cause of death. Community based information has inherent problem of under reporting and lack in accurate analysis of the causes. By approaching the information that is available in a pragmatic manner, it may be possible to understand the magnitude and pattern of the problem.

Methods

The present study was conducted by reviewing the maternal mortality data obtained from our teaching institution and from Satara district health authority's health management information system (HMIS), and covered a period of 5 years from April 2000 to March 2005. An attempt was made to estimate the pattern of causes of death by reviewing the maternal mortality committee reports of the reported deaths.

Maternal mortality data reported from three other teaching institutes in western Maharashtra viz., Sangli, Miraj and Pune², spanning a period of four decades were analyzed to understand the changing trends with respect to rates and pattern of causation. The purpose was to assess the improvement in health care management over the years and the unmet needs that need to be addressed.

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Results and Discussion

During the period from April 2000 to March 2005, the number of total births in our maternity department was 9682 and maternal deaths were 31 giving an MMR of 32 per 10,000 births. Data collected from district health authorities of Satara revealed total births as 42501 and maternal deaths as 160, giving MMR as 37 (Table 1).

Table 1. Maternal deaths (5 years)

Location	No. of deaths reported	No. of births	MMR/10000
Our institution	31	9682	32
Satara District	160	42501	37

Source - Health Management Information System.

Out of total 191 maternal deaths, 178 (93%) were from rural areas, 151 (79%) in women who were unregistered or inadequately registered, and 110 (57%) in women delivered at home. As many as 124 (64%) women died in their first pregnancy (Table 2) where pregnancy induced hypertension (PIH) and anemia were major contributory factors.

Table 2. The study population characters (n=191)

Character	Number	Percent
Rural	178	93
Unbooked	151	79
Home delivery	110	57
Primigravida	124	64
Abortion	12	06

Causes of death

Analysis of causes of death revealed obstetric hemorrhage

Table 3. Causes of death ^a

	Hemorrhage	PIH	Sepsis	Obstetric Cause	Embolism	Abortion	Others
Our institution (n=31)	21 (67%)	10 (32%)	2 (6%)	1	2	2	1
Satara district (n=160) ^b	93 (58%)	68 (42%)	20 (12%)	3	3	11	4
Total (n=191)	114 (60%)	78 (40%)	22 (11%)	4	5	13	5

^a Some women died of more than one cause

^b Source - Health Management Information system.

Table 4. Deaths due to hemorrhage (n=114)

Cause of death	No.	Associated cause	
		PIH	Anemia
PPH	71	47	52
Placental abruption	28	24	17
Other antepartum hemorrhage	15		

as the leading cause. Out of 31 institutional deaths 21 were due to hemorrhage. Severe PIH and eclampsia related deaths were 10. Only two deaths were attributable to sepsis occurring in immunocompromised women. Embolism was suspected in two women. Remarkably no case of obstructed labor or rupture of uterus was encountered. Only one woman died because of inversion of uterus (Table 3).

Reviewing data from Satara district, out of 160 maternal deaths reported, 93 were due to hemorrhage, 68 due to PIH, and 20 due to puerperal and abortion related sepsis (Table 3). Total number of abortion deaths reported were only 13 (6%) probably because of better availability of medical facilities though under reporting is likely.

Amongst 114 deaths due to hemorrhage primary PPH occurred in 71 and antepartum hemorrhage (APH) in 43 of which 28 had placental abruption (Table 4). Hemorrhage and PIH together accounted for most of the deaths excluding 22 due to sepsis and 14 due to other medical causes including embolism. PIH itself was responsible for causing abruption, PPH and circulatory collapse (62%) thus adding to number of hemorrhagic deaths. Moreover, it was responsible for deaths in young primigravida women.

Comparison of causes of deaths

Since maternal mortality has declined considerably, analysis of causes of death needs to be reviewed in relation to changing pattern over past decades. To place the picture in its proper perspective, maternal mortality data reported from three major referral institutes of Sangli, Miraj and Pune covering a period of four decades are reviewed and analyzed (Table 5).

Table 5. Causes of maternal deaths - changing trends

Year	Institution	MMR/ 10000	Hemorrhage %	Pregnancy induced hypertention %]	Sepsis %	Obstetric causes %	Hepatitis	Thrombo embolism	Other
1966-68	Patil and Anjaneyelu ² Pune	14	15	14	16	8	38	3	6
1970-74	Santpur ³ Miraj	18	25	11	22	20	16	3	6
1984-92	Shrotri ⁴ Pune	46	19	22	12	4	22	3	6
1983-92	Jadhav ^a Miraj	58	12	10	24	4	40	5	3
1998-03	Mule ^a Sangli	41	14	15	20	1	11	5	7
1999-05	KIMS, Karad (Present study)	32	67	32	6	3	6	2	6
1999-05	Satara district (Present study)	37	58	42	12	2	2	3	15

^a Unpublished data

MMR has declined sharply from 140 per 10,000 in 1966 to 58 per 10,000 by the year 1992. Thereafter a steady but slow decline continued reaching present level of 32 at our institute and 37 as reported from district level. Though district report lacks accuracy and is hampered by incomplete collection, it does reflect declining trend and changing pattern. A similar declining trend from 208 to 7 in 26 years is reported by Sapre and Joshi ⁵.

Deaths due to hemorrhage ranged from 14 to 25% depending upon referral population and percentage proportion in other categories like hepatitis taking a major toll during their outbreak. Severe PIH as a contributory cause comes close second and has remained steady all through. Most of the deaths, 142 out of 191 in the present series occurred because of hemorrhage and PIH leading to APH, PPH and other complications.

The high proportion of both these factors together is because of diminution in other causes. Deaths due to sepsis have reduced from 22% to 6 to 12%, thanks to better surgical care, wide range of antibiotics, and critical care being available. Obstetric causes like obstructed neglected labor, rupture uterus, abortion and ectopic pregnancy have sharply declined from 20% to 3% due to better surgical and anesthetic facilities being readily available. There is no change in deaths due to thromboembolism and other medical problems.

Conclusion

Reviewing maternal deaths over the last 40 years, there appears an urgent need to address the issue of obstetric hemorrhages and early intervention in PIH. Much needs to be done for maternal health care in rural areas, as most of the deaths reported from urban institutions are referrals from peripheral centers. Maternal deaths from districts are possibly higher than what are reported here. Concentrated efforts are required to obtain the missing data by improvising better and accurate data collection. Instituting integrated maternal health services with emphasis on primary health care can achieve remarkable improvement in maternal outcome.

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